

UNIVERSITY OF CALIFORNIA.

AGRICULTURAL EXPERIMENT STATION.

BULLETIN NO. 4.

[In order to render the results of investigations and experiments conducted by the Agricultural Department of the University of California more quickly and more generally available than has heretofore been done through the annual or biennial reports, it is proposed to embody hereafter, in the form of "Bulletins," to be issued as often as may seem desirable, report of results, as well as such other discussions, information or answers to questions as may be of general interest. It is intended to make these bulletins, as a rule, short enough for insertion in the daily or weekly papers of the State, and proof-slips of the same will be regularly mailed to papers applying therefor. The substance of these bulletins will ultimately be embodied in a more complete and connected form, in the annual reports of the College of Agriculture.]

The chief material thus far used in tanning in California is the bark of the chestnut-leaved or tan-bark oak (*Quercus densiflora*); the bark of the other native oaks being but little esteemed for the purpose, and moreover costly in stripping, on account of their low, sturdy and branching habit of growth. The tan-bark oak, however, is a tree of comparatively limited range, and already in consequence of the brisk demand for its bark, very serious inroads have been made upon the forests of which it mostly forms only a subordinate ingredient. Whether in the future the demand can be supplied by the hemlock bark of the Northern coast, is as yet a mooted question; hence the importance of endeavoring to develop, within the State, some reliable and permanent source of supply for the various purposes of the tanner, and which shall yield more quickly than the slow-growing native oak. The following determinations have been made with this view, the material being from plants known to be well adapted to this climate.

Analyses of Tanning Materials.

NAME.	Moisture lost in air-drying—per cent.	Moisture remaining in air-dried material—per cent.	Per cent. of tannin in—		
			Fresh	Air dried	Dried at 100° C.
1. Bl'k Wattle (<i>Acacia decurrens</i> , var. <i>mollissima</i> .) Bark	36.23	9.47	26.4	41.4	48.6
2. Silver Wattle (<i>Acacia decurrens</i> , var. <i>dealbata</i> .) Bk	33.59	13.60	13.1	19.7	24.8
3. Golden Wattle (<i>Acacia pycnantha</i> .) Bark	33.67	7.43	27.6	41.6	46.8
4. European Tanner's Sumac (<i>Rhus Coriaria</i>) Leaves	.....	10.20	.....	16.8	18.7
5. Californian Tall Sumac (<i>Rhus integrifolia</i> .) Leaves	.....	.....	.....	11.7	....
6. "Canaigre" (root of <i>Rumex hymenosepalus</i>).....	71.70	11.40	9.6	34.2	38.4

* Loss when dried at 100° C., or 212° Fahr.

The wattles, Nos. 1, 2 and 3, are species of acacia used in Australia as sources of tan-bark, which is known in commerce as "Mimosa bark."

All are more or less in cultivation in California for ornamental purposes, the one most commonly seen being No. 2, with feathery leaves and golden-hued, odorous flowers, now just bursting into bloom. It is usually designated by nurserymen as *Acacia mollissima*, which name, however, according to Von Muller, properly belongs to the black wattle, No. 1, while No. 2 should be known as *A. dealbata*, from the whitish, silvery sheen of the leaves. Both are supposed to be mere varieties of one and the same species, *A. decurrens*. It will be noted, however, that they differ very widely in value as sources of tan-bark, the silver wattle showing only half the amount of tannin contained in the bark of the black variety. But even this does not fully express the superior value of the latter, the bark of which is nearly one-quarter of an inch in thickness, while that of the former is less than half as thick, viz., .3-32 of an inch, so that in one case the expense of production would be bestowed upon less than one-fourth of the active tannin produced in the other. As the two kinds are very much alike in appearance, it is important to bear this fact in mind. The plants now offered for distribution from the University are seedlings grown from a tree on the grounds of the institution, 13 years old, which is twelve inches in diameter three feet above the ground, and forty feet high; therefor of rapid growth. The wood is used for cask staves, wagon-making, etc. in Australia, and is excellent firewood.

No. 3, the Golden wattle, though having a bark equal in every respect to that of the black wattle, is a much smaller tree; hence more costly in stripping and the wood of less value.

All are quite modest in their requirements as to soil and care.

Further details on this subject may be found in the report of the College of Agriculture for 1882, and in the U. S. Agricultural Report for 1878.

The European Tanner's sumac, No. 4, has now been grown for several seasons on the University grounds, and, as might be expected from its Mediterranean origin, is found perfectly adapted to the climate of Middle and Southern California. Its leaves show the full average of the European product in the tannin percentage, and, as it is especially valued for preparing the finer kinds of fancy leather, its product is higher priced than that of the American sumacs, which, moreover, would not thrive so well in this climate. The seed of this plant, imported last season, has unfortunately not germinated well, so that plants cannot as yet be distributed for trial in the State. (For farther details see the Report of the College for 1882, page 108.)

For comparison I place alongside No. 5, showing the tannin percentage of the leaves of the South Californian tall sumac, as given in the report of the College for 1879. Its product might perhaps be improved by cultivation, but its foliage is less abundant than that of the Sicilian, and there seems to be no reason for preferring it, except where it can be gathered from the wild bushes.

No. 6 shows the tannin percentage of the root of the *Canaigre*, or Tanner's Dock of Texas, New Mexico, Arizona, Southern California and adjacent portions of Mexico, where it frequents deep sandy, and often otherwise unavailable soils, which often teem with its small, sweet-potato-like, fleshy roots. The samples were kindly furnished by Dr. C. C. Parry, from near San Geronio Pass, and it is now growing on the University grounds. The same root was investigated by the U. S. Department of Agriculture (see reports for 1878 and 1879); but the present sample shows a tannin percentage higher by one-half than the Texas samples there reported.

It appears as the general result of these investigations, that as regards the wattles, the sumac and the dock, the dry climate of California brings their tannin percentage fully up to that which they show in their native countries; and as regards the two former at least, it cannot be doubted that they can be profitably grown in this State, with anything like a healthy state of the labor market. The planting of ten acres of the black wattle, lately reported as having been made near San Gabriel, by Mr. J. De Barth Shorb, will, before long, bring the matter to a practical test; since the trees are stripped when from five to ten years old.

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